

26436 - Engineering Geology

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	296 - Degree in Geology
ECTS	5.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

Brief intro to the course

Engineering geology is the application of scientific methods and geological principles to the acquisition, interpretation, and use of knowledge of materials of the Earth's crust and earth materials for the solution of engineering problems and the design of engineering works. It is the applied science of predicting the behaviour of the Earth, its various materials and processes towards making the Earth more suitable for human activities and development.

It embraces the fields of soil mechanics and rock mechanics, and many of the aspects of geology, geophysics, hydrology, and other related sciences.

1.2.Recommendations to take this course

This course is among the courses devoted to those applied aspects of Geology. It requires some familiarity with solving numerical problems, as usual in Physics or Mathematics, and the ability to integrate the studied topics within the wider scope of matters learned in other courses. It is recommended to have successfully passed courses on physics and structural geology in previous years. It is recommended, as well, to assist to all lectures and the rest of activities, to keep a daily routine of work in order to fulfil the deadlines for papers and questionnaires, and to make use of tutorial times.

1.3.Context and importance of this course in the degree

This course is usually undertaken in the fourth year of the degree. Therefore, the students are expected to already have wide geological knowledge, and to be skilled at using the necessary tools -both physical and conceptual- usually fielded in geology.

1.4.Activities and key dates

This module consists of lectures, field work, practical laboratories, tutorial exercises, case histories and coursework exercises.

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Key dates:

First official week: kick off of the lectures

Second official week: first practical

Tests period: to be determine by the faculty

Teachers

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2.Learning goals

2.1.Learning goals

To successfully pass this course the student will achieve to...

... know concepts and basic terminology on this discipline

... know geomechanical parameters and usual geomechanical classifications of rock masses

... know the fundamental on geology surveying for civil engineering works

... know the methodology on surface and underground hydrology for engineering applications

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

In this course the main objectives are that the prospective student acquires a series of professional competencies in the field of engineering geology, with appreciation of the importance of geology in civil engineering, whilst embracing the ethical compromise of a fully fledged professional geologist.

3.2.Competences

Upon completion of this course, students will be able to:

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- plan basic geological surveying according to the engineering goal.
- interpret results from a variety of tests.
- perform basic calculations on surface and underground hydrology for civil engineering.

4. Assessment (1st and 2nd call)

4.1. Assessment tasks (description of tasks, marking system and assessment criteria)

1. Assessment activities

Continuous evaluation

1. Questionnaires (running test): at the end of each lecture the student must answer one or more questions related to the topic at hand.
2. Practicals: At the end of each practical session the student will either present the results, or answer on a or more questions about it.
3. Written test. Near the end of the term there will be a test (about 4h long) with question and/or problems to evaluate the understanding of the course. The student may consult books, course notes, etc.

Global Evaluation test

Students that failed to follow the course, and those that wish to, have the right to a global evaluation test. It consist on a written test, alike the previously described, and an it may include additional test where the student will show his/her skills with geophysical instruments.

2. Assessment criteria or Course Grade Distribution

Continuous evaluation mode

$grade = (test \times 0.7) + (continuous \text{ ev.} \times 0.3)$, where "continuous ev." referees to (classroom questions + additional problems) x 0.5

Global test

5. Methodology, learning tasks, syllabus and resources

5.1. Methodological overview

This module consists of lectures, practical laboratories, tutorial exercises, may include case histories and coursework

exercises.

5.2.Learning tasks

Activity 1 . Learning of concepts, descriptions and calculations bases.

Lectures (1.5 ECTS)

Tutorials and seminars (0,5 ECTS)

Activity 2 . Learning of procedures

Field work (1.2 ECTS)

Lab work: problems (1.3 ECTS)

Seminars and tutorials (0.5 ECTS)

5.3.Syllabus

Course syllabus

T1. Rock mass characterisation and classification.

T2. Rock slope stability.

T2. Surface hydrology in civil engineering.

T3. Monitoring slopes.

T4. Tunnels.

T5. Dams.

T6. Roads.

T7. Special terrains.

5.4.Course planning and calendar

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5.5. Bibliography and recommended resources

- BB** Azizi, Fethi. Applied analyses in geotechnics / Fethi Azizi . London ; New York : Taylor & Francis, 2000
- BB** Bowles, Joseph E.. Propiedades geofísicas de los suelos / Joseph E. Bowles ; traducción Eugenio Retamal, Hugo Cosme ; revisión Luciano Rivera Bogotá [etc.] : McGraw-Hill, cop. 1982
- BB** Cornforth, D.H.. Landslides in practice. Wiley. 2005
- BB** Geotécnia y cimientos. V. 1, Propiedades de los suelos y de las rocas / J.A. Jiménez Salas, J.L. de Justo Alpañes . - 2a. ed. Madrid : Rueda, D.L. 1975
- BB** Geotécnia y cimientos. V. 2, Mecánica del suelo y de las rocas / J.A. Jiménez Salas, J.L. de Justo Alpañes, Alcibíades A. Serrano González . - 2a ed Madrid : Rueda, D.L. 1981
- BB** Geotécnia y cimientos. V. 3, Cimentaciones, excavaciones y aplicaciones de la geotecnia / coordinador y director edición, José Antonio Jiménez Salas ; Luis del Cañizo Perate...[et al.] Madrid : Rueda, D.L. 1980
- BB** Ingeniería geológica / Luis I. González de Vallejo...[et al.] Madrid [etc.] : Prentice Hall, 2006
- BB** Lambe, T. William. Mecánica de suelos / T. William Lambe, Robert V. Whitman ; [versión española José A. Jiménez Salas, Jose Ma. Rodriguez Ortiz ; revisión Alfonso Rico Rodríguez] . - [8a. reimp.] Mexico [etc.] : Limusa, 1991
- BB** Manual de campo para la descripción y caracterización de macizos rocosos en afloramientos / [editores, Mercedes Ferrer, Luis I. González de Vallejo] Madrid : Instituto Tecnológico GeoMinero de

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España, 200

- BB** Milanovic, Peter. Geological engineering in karst. Zebra Publishing. 2000
- BB** Price, D. G.. Engineering Geology. Springer. 2009
- BB** Turner, A.K., Schuster, R.L. (ed.). Landslides. Investigation and mitigation. National Academy Press. 1996

LISTADO DE URLs:

Código Técnico de la Edificación.
Documento Básico SE-C. Seguridad
estructural: Cimientos -

[<http://www.fomento.gob.es/NR/rdonlyres/204AF31C-67E0-402A-BC8A-CB110C8>

Dr. Evert Hoek's Practical Rock
Engineering (2007 ed.) -

[http://www.rocscience.com/education/hoek_corner]

Guía de cimentaciones en obras de
carretera -

[http://www.fomento.gob.es/MFOM/LANG_CASTELLANO/ESTADISTICAS_Y_PU

Verruijt, A. Soil Mechanics. Delft University
of Technology. Documento PDF

"SoilMechBook2012.pdf" -
[<http://geo.verruijt.net/>]